No. 200200181

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PH70R'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixth day of July, in the year two thousand and four.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

☐REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME
PH70R

4. ADDRESS (*Street and No. or RFD No., City, State and Zip Code, and Country*)
7301 NW 62nd Avenue
P.O. Box 85
Johnston, IA 50131-0085

5. TELEPHONE (*Include area code*)
515/270-4051

6. FAX (*Include area code*)
515/253-2125

FOR OFFICIAL USE ONLY
PVPO NUMBER
200200181
FILING DATE
June 6,2002

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (*corporation, partnership, association, etc.*)
Corporation

8. IF INCORPORATED, GIVE STATE OF INCORPORATION
IOWA

9. DATE OF INCORPORATON
March 5, 1999

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION (FIRST PERSON LISTED WILL RECEIVE ALL PAPERS)

Steven R. Anderson
Research and Product Development
P.O. Box 85
Johnston, IA 50131-0085

FEES RECEIVED
FILING & EXAMINATION FEES: $ 2705.00 DATE 6/6/02
CERTIFICATION FEE: $ 432.00 DATE 6/18/04

11. TELEPHONE (*Include area code*)
515/270-4051

12. FAX (*Include area code*)
515/253-2125

13. E_MAIL
Steven.Anderson@Pioneer.com

14. CROP KIND NAME (*Common name*)
CORN

15 GENUS AND SPECIES NAME OF CROP
Zea Mays

16. FAMILY NAME (*Botanical*)
Gramineae

17. IS THE VARIETY A FIRST GENERATION HYBRID?
☐ Yes ☒ No

18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of the Variety
d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☒ Voucher Sample *(2500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☒ Filing and Examination Fee ($2,705), made payable to "Treasurer of the United States" *(Mail to Plant Variety Protection Office)*

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act)
☐ YES (If "yes", answer Items 20 and 21 below) ☒ NO (If "no", go to Item 22)

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? ☐ YES ☐ NO
IF "YES" WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ YES ☐ NO
IF "YES" SPECIFY THE? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED
Number 1,2,3 etc.
If additional explanation is necessary, please use the space indicated on the reverse.)

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U.S. OR OTHER COUNTRIES?
☒ YES ☐ NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse)*

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?
☐ YES ☒ NO
IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

24. The owner(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and results in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
NAME *(Please print or type)*		NAME *(Please print or type)* Steven R. Anderson	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE Research Scientist	DATE 5-15-02

S&T-470 (04-01)designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (02-99) which is obsolete. *(See reverse for instructions and information collection burden statement)*

INSTRUCTIONS

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GENERAL: To be effectively filed with the Plant Variety protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) completed application form signed by the owner; (2) completed Exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in a approved public repository; (4) check drawn on a U.S. bank for $2705 ($320 filing fee and $2,385 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 400, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301)504-5518
FAX: (301)504-5291
Homepage: http://www.ams.usda.gov/science/pvp.htm

ITEM

18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified.

18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens of photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

18c. Exhibit C forms are available from the PVPO for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant disease resistance, etc.

18e. Section 52(5) of the Act required applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

19. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of* certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, applicant may change the choice. *(See Regulations and Rules of Practice, Section 7.103).*

22. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date

21. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety ahs been sold, disposed of, transferred, or used in the U>S> or other countries.)

Nov. 1, 2001 United States

23. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).*

NOTES; It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of Regulations and Rules of Practice.)*

To avoid conflict with other variety names in use, the applicant should check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center--East, Beltsville, MD 20705. Telephone: (301) 504-8089. http://www.ams.usda.agov/lsg/seed/ls-sd.htm

APPENDIX A

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Exhibit A. Origin and Breeding History

Pedigree: PH1BC/PH32C)X5112212

Pioneer Line PH70R, *Zea mays L.*, a dent corn inbred with dent-like kernel texture, was developed by Pioneer Hi-Bred International, Inc. from the single cross hybrid PH1BC (Certificate No. 200000242) X PH32C (PVP Certificate No. 9700224) using the pedigree method of plant breeding. Varieties PH1BC and PH32C are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing was practiced from the above hybrid for 10 generations using pedigree selection. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Macomb, Illinois, as well as other Pioneer research locations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations again made for uniformity.

Variety PH70R has shown uniformity and stability for all traits as described in Exhibit C - "Objective Description of Variety". It has been self-pollinated and ear-rowed 8 generations with careful attention paid to selection criteria and uniformity of plant type to assure genetic homozygousity and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity and stability, and for 6 generations during the final stages of inbred development and seed multiplication. Very high standards for genetic purity have been established morphologically using field observations and electrophoretically using sound lab molecular marker methodology.

No variant traits have been observed or are expected in PH70R.

The criteria used in the selection of PH70R were yield, both per se and in hybrid combinations; late season plant health, grain quality, stalk lodging resistance, and kernel size, especially important in production. Other selection criteria include: ability to germinate in adverse conditions; disease and insect resistance; pollen yield and tassel size.

Season/Year Pedigree Grown	Inbreeding Level of Pedigree Grown
Feb/1995 PH1BC	F0
Feb/1995 PH32C	F0
June/1995 PH1BC/PH32C	F1
Oct/1995 PH1BC/PH32C)X	F2
Oct/1996 PH1BC/PH32C)X5	F3
May/1997 PH1BC/PH32C)X51	F4
Oct/1997 PH1BC/PH32C)X511	F5
Apr/1998 PH1BC/PH32C)X5112	F6
Oct/1998 PH1BC/PH32C)X51122	F7
May/1999 H1BC/PH32C)X511221	F8
Oct/1999 H1BC/PH32C)X5112212	F9
Apr/2000 PH1BC/PH32C)X51122121	F10
PH1BC/PH32C)X51122121X	F11

*PH70R was selfed and ear-rowed from F3 through F10 generation.
#Uniformity and stability were established from F5 through F10 generation and beyond when seed supplies were increased.

Exhibit B: Novelty Statement

Variety PH70R mostly resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PH56C (PVP Certificate No. 9600200). Tables 1A and 1B show two sample t-tests on data collected primarily in Johnston, Ankeny, and Dallas Center, IA. The traits collectively show measurable differences between the two varieties.

Variety PH70R has a greater leaf angle (24.1degrees vs 13.0degrees) than variety PH56C (Table 1A, 1B).

Variety PH70R has more leaves above the top ear (7.4 vs 6.2) than variety PH56C (Table 1A, 1B).

Variety PH70R has a greater tassel branch angle (28.1degrees vs 14.2degrees) than variety PH56C (Table 1A, 1B).

Variety PH70R has fewer kernel rows/ear (14.1 vs 16.3) than variety PH56C (Table 1A, 1B).

Variety PH70R also resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PH1BC (PVP Certificate No. 200000242). Tables 1C and 1D show two sample t-tests on data collected primarily in Johnston, Ankeny, and Dallas Center, IA. The traits collectively show measurable differences between the two varieties.

Variety PH70R has a lower tassel floret density (12.1florets/ 4cm vs 20.0 florets/4cm) than variety PH1BC (Table 1C, 1D).

Exhibit B: Novelty Statement Tables

Table 1A: Data from Johnston, Ankeny, and Dallas Center, IA broken out by year and across environments are supporting evidence for differences between PH70R and PH56C. Each year varieties were grown in 3 locations that had different environmental conditions. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

TRAIT	Year	Variety 1	Variety 2	Count 1	Count 2	Mean 1	Mean 2	Mean Diff	StdDeviation 1	StdDeviation 2	StdError 1	StdError 2	DF Pooled	tValue Pooled	Prob>|t| Pooled
ear row number	2000	PH70R	PH56C	15	15	14.4	16.3	-1.9	1.121	1.033	0.289	0.267	28	-4.7	0.000
ear row number	2001	PH70R	PH56C	15	15	13.9	16.3	-2.4	1.187	1.486	0.307	0.384	28	-4.9	0.000
leaf angle (degrees)	2000	PH70R	PH56C	15	15	22.9	9.6	13.3	2.764	4.256	0.714	1.099	28	10.2	0.000
leaf angle (degrees)	2001	PH70R	PH56C	15	15	25.3	16.5	8.8	5.298	2.748	1.368	0.710	28	5.7	0.000
leaf number above top ear	2000	PH70R	PH56C	15	15	7.2	5.7	1.5	0.561	0.704	0.145	0.182	28	6.3	0.000
leaf number above top ear	2001	PH70R	PH56C	15	15	7.7	6.7	1.0	0.488	0.617	0.126	0.159	28	4.9	0.000
tassel branch angle (degrees)	2000	PH70R	PH56C	15	15	22.4	12.8	9.6	4.188	4.395	1.081	1.135	28	6.1	0.000
tassel branch angle (degrees)	2001	PH70R	PH56C	15	15	33.7	15.5	18.2	7.554	7.615	1.950	1.966	28	6.6	0.000

Exhibit B. Novelty Statement Tables

Table 1B: Summary data from Johnston, Ankeny, and Dallas Center, IA across years and environments are supporting evidence for differences between PH70R and PH56C. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

TRAIT	Variety 1	Variety 2	Count 1	Count 2	Mean 1	Mean 2	Mean_Diff	StdDeviation 1	StdDeviation 2	StdError 1	StdError 2	DF Pooled	tValue Pooled	Prob 2 tail Pooled
leaf angle (degrees)	PH70R	PH56C	30	30	24.1	13.0	11.1	4.318	4.958	0.788	0.905	58	9.2	0.000
leaf number above top ear	PH70R	PH56C	30	30	7.4	6.2	1.2	0.568	0.805	0.104	0.147	58	6.9	0.000
tassel branch angle (degrees)	PH70R	PH56C	30	30	28.1	14.2	13.9	8.321	6.265	1.519	1.144	58	7.3	0.000
ear row number	PH70R	PH56C	30	30	14.1	16.3	-2.1	1.167	1.258	0.213	0.230	58	-6.8	0.000

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Exhibit B: Novelty Statement Tables

Table 1C: Data from Johnston, Ankeny, and Dallas Center, IA broken out by year and across environments are supporting evidence for differences between PH70R and PH1BC. Each year varieties were grown in 3 locations that had different environmental conditions. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

TRAIT	year	variety-1	variety-2	Count-1	Count-2	Mean-1	Mean-2	Mean_Diff	StdDeviation-1	StdDeviation-2	StdError-1	StdError-2	DF_Pooled	t-Value_Pooled	Prob_(2-tail)_Pooled
tassel axis floret density (# of florets/4cm)	2000	PH70R	PH1BC	15	15	10.1	19.5	-9.5	1.668	3.044	0.431	0.786	28	-10.6	0.000
tassel axis floret density (# of florets/4cm)	2001	PH70R	PH1BC	15	15	14.1	20.5	-6.3	3.182	4.086	0.822	1.055	28	-4.7	0.000

Exhibit B. Novelty Statement Tables

Table 1D: Summary data from Johnston, Ankeny, and Dallas Center, IA across years and environments are supporting evidence for differences between PH70R and PH1BC. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

TRAIT	variety-1	variety-2	Count-1	Count-2	Mean-1	Mean-2	Mean_Diff	StdDeviation-1	StdDeviation-2	StdError-1	StdError-2	DF_Pooled	t-Value_Pooled	Prob_(2-tail)_Pooled
assei axis floret density (# of florets/4cm)	PH70R	PH1BC	30	30	12.1	20.0	-7.9	3.241	3.572	0.592	0.652	58	-9.0	0.000

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United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

Objective Description of Variety
Corn (Zea mays L.)

Name of Applicant (s)	Variety Seed Source	Variety Name or Temporary Designation
Pioneer Hi-Bred International, Inc.		PH70R
Address (Street & No., or RFD No., City, State, Zip Code and Country		FOR OFFICIAL USE
7301 NW 62nd Avenue, P.O. Box 85, **Johnston, Iowa 50131-0085**		PVP0 Number **200200181**

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding Leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by an '*' are considered Necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices: describe #25 and #26 in Comments section):

01=Light Green	06=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe) 26=Other (Describe)

STANDARD INBRED CHOICES

(Use the most similar (in background and maturity) of these to make comparisons based on **grow-out trial data**):

Yellow Dent Families:		Yellow Dent (Unrelated):	Sweet Corn:
Family	Members	Co109, ND246,	C13, Iowa5125, P39, 2132
B14	CM105, A632, B64, B68	Oh7, T232,	
B37	B37, B76, H84	W117, W153R,	Popcorn:
B73	N192, A679, B73, NC268	W18BN	SG1533, 4722, HP301, HP7211
C103	Mo17, Va102, Va35, A682		
Oh43	A619, MS71, H99, Va26	White Dent:	Pipecorn:
WF9	W64A, A554, A654, Pa91	C166, H105, Ky228	Mo15W, Mo16W, Mo24W

EXHIBIT C: PH70R

	Standard Variety Name
1. TYPE: (describe intermediate types in Comments section): 2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental Dent-like	MO17
2. REGION WHERE DEVELOPED IN THE U.S.A.: 2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other	Standard Seed Source PI 558532

3. MATURITY (In Region of Best Adaptability; show Heat Unit formula in 'Comments' section)

DAYS	HEAT UNITS		DAYS	HEAT UNITS
073	1,423.5	From emergence to 50% of plants in silk	075	1,496.2
073	1,420.5	From emergence to 50% of plants in pollen	072	1,418.8
003	0,072.3	From 10% to 90% pollen shed	003	0,068.5
		From 50% silk to optimum edible quality		
		From 50% silk to harvest at 25% moisture		

4. PLANT:	Standard Deviation	Sample Size	Standard Deviation	Sample Size
246.8 cm Plant Height (to tassel tip)	15.60	06	215.7	04.27	06
077.3 cm Ear Height (to base of top ear node)	08.14	06	083.2	06.65	06
016.0 cm Length of Top Ear Internode	01.60	06	015.1	00.70	06
0.0 Average Number of Tillers	00.00	06	0.0	00.01	06
0.9 Average Number of Ears per Stalk	00.10	06	0.7	00.32	06
4 Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark 5=Very Dark			1		

5. LEAF:	Standard Deviation	Sample Size	Standard Deviation	Sample Size
10.6 cm Width of Ear Node Leaf	00.66	06	10.2	00.82	06
79.4 cm Length of Ear Node Leaf	04.11	06	71.4	03.52	06
07 Number of leaves above top ear	00.45	06	06	00.67	06
24 Degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	03.82	06	26	04.85	06
03 Leaf Color (Munsell code) 7.5GY3/4			03 5GY3/4		
1 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			2		
Marginal Waves (Rate on scale from 1=none to 9=many)					
Longitudinal Creases (Rate on scale from 1=none to 9=many)					

6. TASSEL:	Standard Deviation	Sample Size	Standard Deviation	Sample Size
07 Number of Primary Lateral Branches	02.35	06	07	01.49	06
28 Branch Angle from Central Spike	07.46	06	41	07.27	06
63.0 cm Tassel Length (from top leaf collar to tassel tip)	05.29	06	59.6	04.26	06
6 Pollen Shed (rate on scale from 0=male sterile to 9=heavy shed)			6		
11 Anther Color (Munsell code) 10R5/6			01 2.5GY8/8		
11 Glume Color (Munsell code) 10RP5/6			01 5GY5/8		
1 Bar Glumes (Glume Bands): 1=Absent 2=Present			1		

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Application Variety Data	PH70R	Page 2	Standard Variety Data

7a. EAR (Unhusked Data):

11	Silk Color (3 days after emergence) (Munsell code)	5R56	01	2.5GY66
01	Fresh Husk Color (25 days after 50% silking) (Munsell code)	5GY63	02	5GY63
21	Dry Husk Color (65 days after 50% silking) (Munsell code)	5Y82	21	2.5Y8.54
1	Position of Ear at Dry Husk Stage: 1= Upright 2= Horizontal 3= Pendant		1	
5	Husk Tightness (Rate of Scale from 1=very loose to 9=very tight)		3	
2	Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)		2	

7b. EAR (Husked Ear Data):		Standard Deviation	Sample Size	Standard Deviation	Sample Size
12.8	cm Ear Length	01.17	06	13.3 03.39	06
38.7	mm Ear Diameter at mid-point	01.03	06	36.5 02.81	06
097.0	gm Ear Weight	20.45	06	66.0 22.48	06
14	Number of Kernel Rows	00.00	06	11.3 01.21	06
2	Kernel Rows: 1=Indistinct 2=Distinct			2	
2	Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral			1	
11.0	cm Shank Length	05.62	06	07.0 02.68	06
1	Ear Taper: 1=Slight 2= Average 3=Extreme			1	

8. KERNEL (Dried)		Standard Deviation	Sample Size	Standard Deviation	Sample Size
10.7	mm Kernel Length	00.52	06	10.3 00.82	06
08.0	mm Kernel Width	00.00	06	08.8 00.41	06
05.0	mm Kernel Thickness	00.00	06	05.0 00.00	06
50.3	% Round Kernels (Shape Grade)	13.26	06	42.8 19.59	06
1	Aleurone Color Pattern: 1-Homozygous 2=Segregating			1	
07	Aluerone Color (Munsell code)		10YR7/4	07	10YR8/4
07 ~~10~~	Hard Endosperm Color (Munsell code)	10YR 6/12	~~10YR8/12~~	07	10YR7/4
03	Endosperm Type: 1=Sweet (Su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other_			3	
28.5	gm Weight per 100 Kernels (unsized sample)	03.08	06	28.83 03.87	06

9. COB:		Standard Deviation	Sample Size	Standard Deviation	Sample Size
22.8	mm Cob Diameter at mid-point	01.17	06	22.3 03.50	06
14	Cob Color (Munsell code) 2.5YR56			14	2.5YR56

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10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):

	A. Leaf Blights, Wilts, and Local Infection Diseases	
	Anthracnose Leaf Blight (Colletotrichum graminicola)	
5	Common Rust (Puccinia sorghi)	7
	Common Smut (Ustilago maydis)	
	Eyespot (Kabatiella zeae)	
	Goss's Wilt (Clavibacter michiganense spp. nebraskense)	
6	Gray Leaf Spot (Cercospora zeae-maydis)	5
	Helminthosporium Leaf Spot (Bipolaris zeicola) Race ———	
5	Northern Leaf Blight (Exserohilum turcicum) Race ———	5
6	Southern Leaf Blight (Bipolaris maydis) Race ———	7
	Southern Rust (Puccinia polysora)	
	Stewart's Wilt (Erwinia stewartii)	
	Other (Specify) ———	
	B. Systemic Diseases	
	Corn Lethal Necrosis (MCMV and MDMV)	
8	Head Smut (Sphacelotheca reiliana)	7
	Maize Chlorotic Dwarf Virus (MDV)	
	Maize Chlorotic Mottle Virus (MCMV)	
3	Maize Dwarf Mosaic Virus (MDMV)	2
	Sorghum Downy Mildew of Corn (Peronosclerospora sorghi)	
	Other (Specify) ———	
	C. Stalk Rots	
5	Anthracnose Stalk Rot (Colletotrichum graminicola)	2
	Diplodia Stalk Rot (Stenocarpella maydis)	
	Fusarium Stalk Rot (Fusarium moniliforme)	
	Gibberella Stalk Rot (Gibberella zeae)	
	Other (Specify) ———	
	D. Ear and Kernel Rots	
	Aspergillus Ear and Kernel Rot (Aspergillus flavus)	
6	Diplodia Ear Rot (Stenocarpella maydis)	9
5	Fusarium Ear and Kernel Rot (Fusarium moniliforme)	7
9	Gibberella Ear Rot (Gibberella zeae)	9
	Other (Specify) ———	

11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); (leave blank if not tested) :

Banks grass Mite (Oligonychus pratensis)	
Corn Worm (Helicoverpa zea)	
Leaf Feeding	
Silk Feeding	
mg larval wt.	
Ear Damage	
Corn Leaf Aphid (Rhopalosiphum maidis)	
Corn Sap Beetle (Carpophilus dimidiatus)	
European Corn Borer (Ostrinia nubilalis)	
1st Generation (Typically Whorl Leaf Feeding)	
2nd Generation (Typically Leaf Sheath-Collar Feeding)	
Stalk Tunneling	
cm tunneled/plant	
Fall Armyworm (Spodoptera fruqiperda)	
Leaf Feeding	
Silk Feeding	
mg larval wt.	
Maize Weevil (Sitophilus zeamaize	
Northern Rootworm (Diabrotica barberi)	
Southern Rootworm (Diabrotica undecimpunctata)	
Southwestern Corn Borer (Diatreaea grandiosella)	
Leaf Feeding	
Stalk Tunneling	
cm tunneled/plant	
Two-spotted Spider Mite (Tetranychus urticae)	
Western Rootworm (Diabrotica virgifrea virgifea)	
Other (Specify) ———	

12. AGRONOMIC TRAITS:

7	Staygreen (at 65 days after anthesis) (Rate on a sale from 1=worst to excellent)	3
	% Dropped Ears (at 65 days after anthesis)	
	% Pre-anthesis Brittle Snapping	
	% Pre-anthesis Root Lodging	
	Post-anthesis Root Lodging (at 65 days after anthesis)	
	Kg/ha Yield of Inbred Per Se (at 12-13% grainmoisture)	

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied):

1 Isozymes	0 RFLP's	0 RAPD's

COMMENTS (eg. state how heat units were calculated, standard inbrd seed source, and/or where data was collected. Continue in Exhibit D):

CLARIFICATION OF DATA IN EXHIBITS B AND C

200200181

Please note the data presented in Exhibit B and C, "Objective Description of Variety," are collected primarily at Johnston, Ankeny and Dallas Center, Iowa. The data in Tables 1A and 1B are from two sample t-tests using data collected in Johnston and Dallas Center, IA. The data in tables 1C and 1D are from two sample t-tests using data collected from Johnston, Ankeny, and Dallas Center, IA. These traits in exhibit B collectively show distinct differences between the varieties.

JMS 9/27/03

The data collected in exhibit C was collected in 2000 and 2001 for page 1 and 2. There were 3 different planting dates planted for these trials. There are environmental factors that differ from year to year. Environmental temperature and precipitation differences during the vegetative and grain fill periods can impact plant and grain traits, and are a source of variability. The environmental conditions described above could result in larger standard deviations. The variation associated with environment to environment is normally higher than the variation associated within locations. Also, the ear and sizing traits can vary depending on how well pollinated the ears are and how consistent the weather is during the grain fill period. I have enclosed a table that shows monthly temperature and precipitation in 2000, and 2001.

20020018I

Exhibit C. Temperature and Precipitation differences from Ankeny, IA

TEMPERATURE

YEAR	MAY	JUN	JULY	AUG	AVERAGE
1994	59.8	70.7	71.9	69.0	**67.9**
1995	56.2	69.4	74.3	76.9	**69.2**
1996	56.2	69.3	71.3	70.5	**66.8**
1997	53.5	70.6	74.1	69.6	**67.0**
1998	64.7	66.6	74.8	73.5	**69.9**
1999	60.7	69.7	78.7	70.5	**69.9**
2000	63.5	68.9	73.2	74.2	**70.0**
2001	61.3	69.0	76.7	74.2	**70.3**
2002	57.7	73.5	77.9	71.7	**70.2**

RAINFALL

YEAR	MAY	JUN	JULY	AUG	Total
1994	3.67	5.75	1.71	4.18	**15.31**
1995	5.04	4.19	2.94	2.87	**15.04**
1996	8.47	4.35	2.51	2.14	**17.47**
1997	4.32	3.27	4.10	1.36	**13.05**
1998	6.46	11.07	5.70	4.96	**28.19**
1999	6.46	4.54	4.45	6.55	**21.85**
2000	5.40	5.80	3.16	1.78	**16.14**
2001	5.72	3.87	2.05	1.92	**13.56**
2002	2.91	2.78	5.34	4.00	**15.03**

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U. S. C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

PIONEER HI-BRED INTERNATIONAL, INC.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME

PH70R

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

7301 NW 62nd AVENUE
P.O.BOX 85
JOHNSTON, IA 50131-0085

5. TELEPHONE *(Include area code)*

515-270-4051

6. FAX *(Include area code)*

515-253-2125

7. PVPO NUMBER

200200181

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block. If no, please explain:* ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO

If no, give name of country

10. Is the applicant the original owner? ☒ YES ☐ NO ***If no, please answer one of the following:***

a. If original rights to variety were owned by individual(s), is(are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO ***If no, give name of country***

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☒ YES ☐ NO ***If no, give name of country***

11. Additional explanation on ownership *(if needed, use reverse for extra space):*

PH70R is owned by Pioneer Hi-Bred International, Inc.

Pioneer Hi-Bred International, Inc. (PHI), Des Moines, Iowa, and/or its wholly owned subsidiary Pioneer Overseas Corporation (POC), Des Moines, Iowa, is the employer of the plant breeders involved in the selection and development of PH876. Pioneer Hi-Bred International and/or Pioneer Overseas Corporation has the sole rights and ownership of PH876 pursuant to written contracts that assign all rights in the variety to PHI and/or POC at the time such variety was created. No rights to this variety are retained by any individuals.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV memt country, or owned by national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See section 41(a)(2) of the Plant Variety Protection Act for definition.